

Chest Pain	Goroll	Porter	Abercrombie	Gomella	Kasper	Wasson	Paulman	Seller	TOTAL	Collected cases
Myocardial ischemia/infarction	x	x	x	x	x	x	x	x	8	19
Pericarditis	x	x	x	x	x	x	x	x	8	
Pulmonary embolism	x	x	x	x	x	x	x	x	8	7
GERD	x	x	x	x	x	x	x	x	8	
Costochondritis (Tietze's syndrome)	x	x		x	x	x	x	x	7	
Pneumonia	x	x	x		x	x	x	x	7	5
Thoracic aortic aneurysm	x	x	x	x	x	x	x		7	6
Cholecystitis	x	x	x	x	x	x			6	
Esophageal spasm	x	x	x		x	x		x	6	
Peptic ulcer disease	x	x	x	x	x	x			6	1
Pleuritis	x	x	x	x	x	x			6	
Pneumothorax	x	x	x	x		x	x		6	11
Cancer (chest, esophagus)		x	x	x	x	x			5	10
Herpes zoster	x	x		x	x		x		5	
Rib fracture	x			x		x	x	x	5	22
Anxiety	x		x	x				x	4	
Disc disease	x				x	x		x	4	1
Esophageal rupture		x			x	x		x	4	
Pancreatitis	x	x	x	x					4	
Prolapsed mitral valve	x		x					x	3	
Muscle spasm	x	x							2	
Asthma			x						1	
Bronchospasm	x								1	
Interstitial lung disease			x						1	
Lung abscess			x						1	
Mets to bone	x								1	8
Myocarditis		x							1	
Pulmonary hypertension				x					1	
Sickle cell crisis			x						1	
Thoracic outlet syndrome			x						1	
Aortic stenosis					x				1	
Shoulder arthritis/bursitis						x			1	
Hypertrophic cardiomyopathy								x	1	
Sternal fracture										6
Pulmonary AVM										1
Pulmonary hemorrhage										1
Hemothorax										1
Thoracic fracture										1

Cause	Clinical Features	Imaging Findings
Pulmonary Structures		
Pneumothorax or pneumomediastinum	History of prior pneumothorax; smoker; young, thin patient; asthma; trauma	XR, CT: air in the pleural space or mediastinum
Pneumonia – community acquired, aspiration, pneumocystis, and tuberculosis	All, including community acquired pneumonia (CAP): Fever (may be absent in elderly), SOB, crackles or dullness, productive cough, chills, HA, elevated WBC count (>10,400). Aspiration pneumonia: Obtundation from dementia, stroke, drugs, or alcohol. Pneumocystis: known HIV/AIDS or risk factors for HIV/AIDS. Pneumonia from tuberculosis: As pneumonia with night sweats and involuntary weight loss.	XR, CT: consolidation and/or pleural effusion (a normal XR does <i>not</i> rule out pneumonia if the pre-test probability is high); unilateral relatively dense lobar consolidation is more likely CAP; bilateral less dense consolidation is typical of pneumocystis; apical consolidation is more typical of pneumonia from tuberculosis.
Lung cancer – primary	Smoking; involuntary weight loss; hemoptysis; shortness of breath (from associated COPD/Emphysema).	XR, CT: lung mass with possible “upstream” pneumonia with consolidation; additional pulmonary nodules/masses, lymphadenopathy, or bone lesions from metastatic deposit.
Mesothelioma	Asbestos exposure. Abnormal breath sounds or pleural rub.	XR, CT: Large mass of the pleura with associated effusion fluid. Calcified pleural plaque.
Asthma	Abnormal breath sounds (especially wheezing) activated by recognizable trigger (e.g. exercise, cold, animal dander); dyspnea; cough; abnormal (reversible) PFTs, response to challenge test.	Usually normal and not done except for excluding pneumonia, pneumothorax, or pulmonary collapse. XR, CT: hyperinflation; increased peribronchial markings,
Pleuritis	Pleuritic chest pain. Abnormal breath sounds or pleural rub.	XR, CT: Pleural thickening or effusion.
Cardiovascular Structures		
Myocardial ischemia/infarction	History of cardiac or vascular disease; exertional pain and dyspnea; chest, neck, jaw, or left upper extremity pain; EKG or enzyme abnormalities; S3 heart sound, pedal edema, prominent jugular veins with accompanying heart failure.	XR, CT: Findings of accompanying heart failure including pulmonary consolidation or ground-glass opacity, pleural effusions, large heart and pulmonary arteries. Myo: abnormal perfusion study with reversible decreased tracer on the stress component of the exam. CTA: calcified/narrowed vessels.
Pulmonary embolism	Cough and dyspnea; history of lower deep venous thrombosis (usually lower extremity);	XR, CT: peripheral wedge-shaped lung opacity (“Hampton’s hump”) with infarction; pleural effusion; CT: filling

	hypercoagulable states; prolonged immobilization from surgery or travel.	defects in the arterial tree; VQ scan: ventilation perfusion mismatches.
Thoracic aortic aneurysm	Chest pain (with ulceration or dissection)	XR, CT: dilated, tortuous aorta distorting the trachea.
Pericarditis	Dyspnea from pericardial effusion; fever; fatigue; cancer; renal failure; autoimmune disease (lupus, rheumatoid arthritis).	XR: enlarged heart with large effusions; CT: pericardial thickening and/or effusion fluid.
Aortic stenosis	Syncope, shortness of breath.	XR, CT: prominent ascending aorta; calcification of the aortic valve
Prolapsed mitral valve	Dyspnea; fatigue.	CT: abnormal mitral valve; dilated left atrium from associated regurgitation.
Other Structures		
Gastroesophageal reflux disease	Heartburn; known hiatal hernia; cough	No direct findings; XR, CT may show a hiatal hernia.
Esophageal rupture	Swallowing an object capable of lacerating the esophagus (bone or metal); vigorous or repeated vomiting.	XR, CT: air in the mediastinum; extravasated oral contrast.
Pancreatitis	Gallstones, alcohol abuse, elevated triglycerides; elevated serum amylase and/or lipase	CT: poor definition of pancreas margins; peri-pancreatic fat stranding; swelling of the pancreas
Rib, sternal, or vertebral fracture	Trauma; point tenderness; pain worse with deep respiration; history of malignancy (with pathologic fracture).	XR, CT: Discontinuity of cortex; abnormal angulation.
Disc disease	Radicular pain; known disc disease at other levels	XR, CT: disc narrowing and osteophytic spurring; CT, MR: abnormal disc contour with compression of nerve roots
Bone metastatic deposit	Personal history of tumor; elevated alkaline phosphatase	XR, CT: discontinuity of bone cortex; lucency or sclerosis of bone; MR: replacement of marrow fat signal with fluid signal
CHEST PAIN WITH NO IMAGING FINDINGS ON CHEST IMAGING STUDIES		
Anxiety, costochondritis (Tietze's syndrome), cholecystitis (unless accompanied by calcified gallstones or extensive inflammation), esophageal spasm, herpes zoster, muscle spasm, and peptic ulcer disease		
ABBREVIATIONS		
CT = computed tomography; CTA = CT angiography; MR = magnetic resonance imaging; Myo = nuclear medicine myocardial perfusion imaging; US = ultrasound; VQ = (nuclear medicine) ventilation/perfusion lung scan; WBC = white blood cell count; XR = x-ray radiography.		

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